

1. A method of noncontact dispensing a conformal coating material onto a surface of a substrate comprising:

providing a positioner supporting a jetting valve with a nozzle and being operable to move the jetting valve;

5 moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating material to the surface of the substrate by iteratively

causing the jetting valve to propel a flow of the conformal coating material through the nozzle with a forward momentum, and

10 breaking the flow of the conformal coating material using the forward momentum to form a droplet of the conformal coating material.

2. The method of claim 1 wherein the substrate has an electrical device mounted thereon and the method further comprises:

15 moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating material to the surface of the substrate and the device by iteratively

causing the jetting valve to propel a flow of the conformal coating material through the nozzle with a forward momentum, and

20 breaking the flow of the conformal coating material using the forward momentum to form a droplet of the conformal coating material.

3. A method of noncontact dispensing a conformal coating material onto solder contacts on a surface of a substrate comprising:

providing a positioner supporting a jetting valve with a nozzle and being operable to move the jetting valve in at least two axes of motion;

5 moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating material to the solder contacts by iteratively

causing the jetting valve to propel a flow of the conformal coating material through the nozzle with a forward momentum, and

10 breaking the flow of the conformal coating material using the forward momentum to form a droplet of the conformal coating material.

4. A method of applying a conformal coating material to a surface, the method comprising:

providing a positioner supporting a jetting valve with a nozzle, the positioner being operable to move the jetting valve along X, Y and Z axes of motion;

15 moving the jetting valve along one of the X and Y axes of motion; and

while moving the jetting valve, creating droplets of the conformal coating material in a first linear pattern on the surface by iteratively

causing the jetting valve to propel a flow of the conformal coating material through the nozzle with a forward momentum,

20 breaking the flow of the conformal coating material using the forward momentum to form a droplet of the conformal coating material, and

applying the droplet of the conformal coating material to the surface of the substrate.

25 5. The method of claim 4 further comprising moving the jetting valve in a first angular axis of motion about one of the X, Y and Z axes of motion.

6. The method of claim 5 further comprising moving the jetting valve in a second angular axis of motion about another of the X, Y and Z axes of motion.

7. The method of claim 4 further comprising:

(a) moving the jetting valve through an increment along an other of the X and Y axes of motion;

5 (b) moving the jetting valve along the one of the X and Y axes of motion; and

(c) while moving the jetting valve, creating droplets of the conformal coating material in a second linear pattern on the substrate contiguous with the first linear pattern by iteratively

10 causing the jetting valve to propel a flow of the conformal coating material through the nozzle with a forward momentum,

breaking the flow of the conformal coating material using the forward momentum to form a droplet of the conformal coating material, and

applying the droplet of the conformal coating material to the surface of the substrate.

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8. The method of claim 7 further comprising coating an area on the surface by iterating steps (a) through (c).

9. The method of claim 4 wherein applying the droplet of conformal coating material has a maximum volume of 5 nanoliters.

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10. The method of claim 4 further comprising iterating the steps of causing, breaking and applying at a rate of about 100 droplets per second to continuously apply the first linear pattern of conformal coating material to the substrate.

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11. The method of claim 4 further comprising applying a droplet to coat a maximum area on the substrate of about $200 \mu\text{m}^2$.